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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

In re patent application of:

Katsunori Sakata et al.

Serial No.: 10/563,116

Group Art Unit: 3664

Filing Date: April 14, 2006

Examiner: Marc, McDieunel

For: TRANSPORTING APPARATUS AND TRANSPORTING CONTROL
METHOD FOR THIN PLATE

Honorable Commissioner for Patents
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

Appellant respectfully appeals the final rejection of claims 1-23 in the Office Action dated May 4, 2009. A Notice of Appeal was filed herein on September 4, 2009 (with a Petition and Fee for One Month Extension of Time).

I. REAL PARTY IN INTEREST

The real party in interest is Rorze Corporation, assignee of 100% interest of the above-referenced patent application.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellant, Appellant's legal representative or Assignee which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

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III. STATUS OF CLAIMS

Claims 1-23 are all the claims presently pending in the application and are being appealed. These claims forth set forth fully in the attached Claims Appendix.

Claims 1 and 15 stand rejected under 35 USC 112, second paragraph as being allegedly indefinite.

Claims 1-22 stand rejected under 35 U.S.C. § 102(b) as being allegedly anticipated or alternatively unpatentable under 35 USC § 103(a) by Davis et al. (U. S. Pat. No. 7,080,652). (Appellant notes that claim 23 is not subject to a prior art rejection and is presumably allowable).

Appellant respectfully appeals these rejections.

IV. STATEMENT OF AFTER-FINAL AMENDMENTS

Appellant notes that an after-final Amendment was filed on July 31, 2009, in which only claim 10 was amended to make a minor correction.

In an Advisory Action dated August 18, 2009, the Examiner indicated that the after-final Amendment "will be entered" for purposes of appeal, and stated simply that "[c]laim limitations are taught to the extent necessary to the actual claim language".

A Notice of Appeal was filed herein on September 4, 2009 (with a Petition and Fee for Two Month Extension of Time).

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

An exemplary aspect of the claimed invention (e.g., as defined by **independent claim 1**) is directed to a transporting apparatus, installed in a given clean environment, for transporting a plate from a predetermined takeoff position to a processing chamber. The apparatus includes a pair of upright support members standing at a predetermined interval.

Importantly, the invention also includes at least one horizontal support table liftably cantilevered on the pair of upright support members, and lift driving means for lifting the horizontal support table vertically, and a robot placed on the horizontal support table and having horizontally rotating arms for taking up and transporting the plate (Application Figures 1-6; page

20, line 5-page 22, line 8).

Another exemplary aspect (e.g., as recited in **independent claim 15**) is directed to a transporting control method of a transporting apparatus, installed in a predetermined clean environment and having rotating arms and end effectors, for transporting a plate from a predetermined takeoff position to a processing chamber. The method includes based on position data of accessed position of the rotating arms and the end effectors, calculating a moving amount in a horizontal direction, a moving amount in a vertical direction and driving data of the rotating arms and the end effectors, moving a robot based on the moving amount in the horizontal direction and the moving amount in the vertical direction and driving the rotating arms and the end effectors based on the driving data, and reading from storing means deflection data of the rotating arms and the end effectors which are extended.

Importantly, this aspect also includes calculating compensation data for compensating a deflected amount based on the deflection data, and compensating the deflected amount based on the compensation data (Application at page 27, line 15-page 29, line 7).

Another exemplary aspect (e.g., as recited in **independent claim 20**) is directed to a transporting control method of a transporting apparatus, installed in a predetermined clean environment and having rotating arms and end effectors, for transporting a plate from a predetermined takeoff position to a processing chamber, including based on position data of accessed position of the rotating arms and the end effectors, calculating a moving amount in a horizontal direction, a moving amount in a vertical direction and driving data of the rotating arms and the end effectors, moving a robot based on the moving amount in the horizontal direction and the moving amount in the vertical direction and driving the rotating arms and the end effectors based on the driving data; and reading from storing means deflection data of the rotating arms and the end effectors which are extended, and compensation data calculated and stored in advance based on the deflected amount.

Importantly, this aspect also includes compensating the deflected amount by adjusting the moving amount in the vertical direction based on the read compensation data (Application at page 27, line 15-page 29, line 7).

These features may allow the invention to eliminate the need for a large power which is required conventionally (Application at page 4, lines 6-12).

VI. ISSUES PRESENTED FOR REVIEW

The issues presented for review by the Board of Patent Appeals and Interferences include:

- 1) whether claims 1 and 15 are indefinite under 35 U.S.C. § 112, second paragraph as alleged by the Examiner; and
- 2) whether claims 1-23 are anticipated under 35 U.S.C. § 102(b) or alternatively unpatentable under 35 USC § 103(a) by Davis et al. (U. S. Pat. No. 3,753,470), as alleged by the Examiner.

VII. ARGUMENT

A. The Examiner's Position

In the Office Action dated May 4, 2009, the Examiner rejected claims 1 and 15 under 35 U.S.C. 112, second paragraph as allegedly being indefinite, stating:

The term "large-sized thin plate" in claims 1 and 15 is a relative term which renders the claim indefinite. The term "large-sized thin plate" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. The size has been defined, therefore the claims are indefinite.

The Examiner also rejected Claims 1-22 under 35 U.S.C. 102(b) as allegedly anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Davis et al. (U. S. Patent 7,080,652), stating:

As per claims 1 and 15, Davis et al. 7080652 teaches a system and an associated method having an automated semiconductor processing that contains a transporting apparatus, installed in a given clean environment, for transporting a large-sized thin plate from a predetermined takeoff position to a processing chamber (see Fig. 5, element 80), comprising: a pair of upright support members standing at a predetermined interval (see Fig. 5 and Fig. 6, element 15); at least one horizontal support table liftably cantilevered on the pair of upright

support members (see col. 7, lines 49-56 and col. 15, lines 30-49); lift driving means for lifting the horizontal support table vertically (see col. 32, line 65 - to - col. 33, line -6); and a robot placed on the horizontal support table and having horizontally rotating arms for taking up and transporting the thin plate (see Figs. 1-2, 33 and 45).

In view of the alternative 103, the large-sized thin plate limitation had been considered as indefinite language. However, element 80 of Fig. 5 has been considered as meeting the above limitation.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to shed light into Davis' reference, because element 80 of Fig. 5 would have introduced as known standard regular CD ROM which in turn being taken as "The most common size of CD-ROM disc is 120 mm in diameter", so that data can be stored, thereby improving the efficiency and the reliability of the transporting apparatus and transporting control method for thin plate.

As per claim 2, Davis et al. 7080652 teaches an automated semiconductor processing that contains wherein the robot drives the horizontally rotating arms to take the thin plate from or back to between the pair of upright support members (see Fig. 6, element 15).

As per claim 3, Davis et al. 7080652 teaches an automated semiconductor processing that contains wherein the horizontal support table comprises tilt adjusting means for changing an angle of the robot placed on the horizontal support table with respect to a horizontal plane (see col. 32, lines 37-46).

As per claims 4-5, Davis et al. 7080652 teaches an automated semiconductor processing that contains that further comprising deflection compensating means for compensating a deflected amount in a vertical direction of the rotating arms and a deflected amount of end effectors provided at respective ends of the rotating arms for taking up and transporting the thin plate (see Figs. 21-23); and wherein the deflection compensating means compensates both of the deflected amounts when the end effectors take up the thin plate (see col. 15, lines 50-67).

As per claims 6, 16 and 18, Davis et al. 7080652 teaches a system and an associated method having an automated semiconductor processing that contains wherein the deflection compensating means comprises deflection storing means (Fig. 32 element 706) for storing deflected amounts in the vertical direction at a

plurality of predetermined measurement points involved in movement of a reference point on the rotating arms or the end effectors and (see abstract and col. 7, lines 49-56), every time the reference point moves to one of the measurement points, the deflection compensating means reads a deflected amount corresponding to a present position from the deflection storing means to compensate the deflected amount (see Figs. 23 and 32).

As per claims 7, Davis et al. 7080652 teaches a system and an associated method having an automated semiconductor processing that contains wherein the deflection storing means stores both a deflected amount due to a selfweight and a deflected amount due to holding of the thin plate (see Fig. 32 element 706 and Fig. 5, element 80), and the deflected amount due to the self weight and the deflected amount due to holding of the thin plate are used to change a compensation amount (see Fig. 5).

As per claim 8, Davis et al. 7080652 an automated semiconductor processing that contains wherein the deflection compensating means comprises compensation controlling means for controlling the lift driving means to raise or lower the horizontal support table based on the deflected amount thereby to compensate deflection of the rotating arms or the end effectors (see Figs. 14 and 45).

As per claims 9, 10 and 17, Davis et al. 7080652 teaches a system and an associated method having an automated semiconductor processing that contains wherein the deflection compensating means comprises compensation controlling means for controlling the tilt adjusting means to tilt the robot placed on the horizontal support table so as to raise or lower the end effectors or the rotating arms thereby to compensate deflection of the rotating arms or the end effectors (see Fig. 14 and col. 32, lines 37-46); wherein the deflection compensating means comprises compensation controlling means for controlling the lift driving means and the tilt adjusting means so as to raise or lower the horizontal support table and/or control the tilt adjusting means to performed tilting based on the deflected amount thereby to compensate deflection of the rotating arms or the end effectors (see col. 32, lines 37-46 as noted above).

As per claims 11 and 20-21, Davis et al. 7080652 teaches a system and an associated method an automated semiconductor processing that contains that further comprising: placing position detecting means (see Fig. 32, elements 706, 1391 and 1351) including a placing position sensor for detecting passage of the thin plate held by the end effectors and calculating means for calculating a displaced amount of the placing position from the reference point based on a detected signal of the placing position sensor (see Fig. 14); and displacement

compensating means for compensating the displaced amount of the placing position based on the calculated displaced amount (see Fig. 36-54).

As per claims 12 and 22, Davis et al. 7080652 teaches a system and associated method having an automated semiconductor processing that contains wherein the placing position detecting means calculates a displaced amount in an X axis direction, a displaced amount in a Y axis direction and a displaced amount in a rotational direction from the predetermined reference point and the displacement compensating means compensates the displaced amounts by moving the end effectors in such a direction that the calculated displaced amounts are cancelled (see Fig. 36-54).

As per claim 13, Davis et al. 7080652 an automated semiconductor processing that contains that further comprising moving means for moving the pair of upright support members horizontally (see Fig. 6, element 15).

As per claim 14, Davis et al. 7080652 an automated semiconductor processing that contains that further comprising a beam for fixedly coupling top portions of the pair of upright support members while the pair of upright support members is held in parallel (see col. 18, lines 33-55).

As per claim 19, Davis et al. 7080652 teaches an automated semiconductor processing that contains, wherein in the step (c), the deflection data read from the storing means depends on whether the thin plate is held or not (see Fig. 32 element 706).

Further, in the Response to Arguments section on page 8 of the Office Action, the Examiner stated:

As to the reference not teaching "at least one horizontal support table liftably cantilevered on the pair of upright support members" (see Fig. 6, element 15 and col. 18, lines 33-55).

As to the reference not teaching "a robot placed on the horizontal support table and having horizontally rotating arms for taking up and transporting the plate" (Figs. 1-2, 33 and 45).

As to the reference not teaching "calculating compensation data for compensating a deflected amount based on the deflection data, and compensating the deflected amount based on the compensation data" (see Fig. 14 and col. 32, lines 37-46).

As to the reference not teaching "a lift driving means for lifting the horizontal support table vertically" (see Fig. 140 which has been considered as vertical table and col. 32, line 65 - to - col. 33, line -6).

In the Advisory Action dated August 18, 2009, the Examiner alleged that Appellant's arguments in the after-final Amendment were not persuasive, stating simply that "[c]laim limitations are taught to the extent necessary to the actual claim language".

B. Appellant's Position

1. Claim Construction

To ascertain the true meaning of a given claim in the patent, resort should be made to the claims at issue, the specification, the other claims of the patent, and the prosecution history. See, e.g., Uniroyal, Inc. v. Rudkin-Wiley Corp., 5 U.S.P.Q.2d 1434, 1441 (Fed. Cir. 1988).

Appellant submits that the claims and written specification are clear and unambiguous and subject to little interpretation. Specifically, it is clear that the specification describes in detail all of the elements and limitations of the claims.

2. The 35 USC 112, Second Paragraph Rejection

The Examiner alleges that claims 1 and 15 are allegedly indefinite.

However, as Appellant noted in the Amendment filed herein on July 31, 2009, claims 1 and 15 were amended by the Amendment filed on January 27, 2009 (deleting the term "thin") to address the Examiner's concerns.

Therefore, these claims are clear and not indefinite, and the Board is respectfully requested to withdraw this rejection.

3. The Prior Art Rejections of the Independent Claims

The Examiner alleges that Davis teaches or makes obvious the claimed invention of

claims 1-22. Appellant would submit, however, that Davis does not teach or suggest each and every element of the claimed invention.

a. Independent Claim 1: Comparison of claim 1 to Davis

Claim 1 recites as follows:

*"A transporting apparatus, installed in a given clean environment, for transporting a plate from a predetermined takeoff position to a processing chamber, comprising:
a pair of upright support members standing at a predetermined interval;
at least one horizontal support table liftably cantilevered on the pair of upright support members;
lift driving means for lifting the horizontal support table vertically; and
a robot placed on the horizontal support table and having horizontally rotating arms for taking up and transporting the plate"*

Therefore, as noted above, the claimed invention as recited in claim 1 is directed to a transporting apparatus which includes at least one horizontal support table liftably cantilevered on the pair of upright support members; lift driving means for lifting the horizontal support table vertically; and a robot placed on the horizontal support table and having horizontally rotating arms for taking up and transporting the plate, as recited in claim 1 (Application Figures 1-6; page 20, line 5-page 22, line 8). Appellant respectfully submits that these features are not taught or suggested by Davis as alleged by the Examiner.

i. The Rejection is Erroneous as a Matter of Law

The Examiner's rejection is erroneous as a matter of law.

In particular, 35 USC §102(b) states:

"A person shall be entitled to a patent unless

...

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States..."

To anticipate a claim, a prior art reference must, either expressly or inherently, disclose each and every limitation in the claim *Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed.Cir.), cert. denied, 484 U.S. 827 (1987).

Clearly, the Examiner has failed to show that Davis discloses each and every limitation in claim 1. In particular, the Examiner has failed to show that Davis teaches or suggests at least one horizontal support table liftably cantilevered on the pair of upright support members; lift driving means for lifting the horizontal support table vertically; and a robot placed on the horizontal support table and having horizontally rotating arms for taking up and transporting the plate, as recited in claim 1.

Further, 35 U. S. C. §103(a) states:

"[a] patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made".

The Supreme Court in *KSR International Co. v. Teleflex Inc. (KSR)*, 550 U.S. 398, 82 USPQ2d 1385 (2007), reaffirmed the familiar framework for determining obviousness as set forth in *Graham v. John Deere Co.* (383 U.S. 1, 148 USPQ 459 (1966)). As reiterated by the Supreme Court in *KSR*, obviousness is a question of law based on underlying factual inquiries. The factual inquiries are (A) Determining the scope and content of the prior art by giving the claims the broadest reasonable interpretation consistent with the specification (See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316, 75 USPQ2d 1321, 1329 (Fed. Cir. 2005)); (B) Ascertaining the differences between the claimed invention and the prior art, by interpreting the claim language and considering both the invention and the prior art as a whole; and (C) Resolving the level of ordinary skill in the pertinent art, considering factors such as (1) type of problems encountered in the art; (2) prior art solutions to those problems; (3) rapidity with which innovations are made; (4) sophistication of the technology; and (5) educational level of active workers in the field.

The *Graham* factors, including secondary considerations when present, are the controlling inquiries in any obviousness analysis. See also *Sakraida v. Ag Pro, Inc.*, 425 U.S. 273, 189 USPQ 449, *reh'g denied*, 426 U.S. 955 (1976); *Dann v. Johnston*, 425 U.S. 219, 189 USPQ 257 (1976); and *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 163 USPQ 673 (1969).

The analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. Rejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006).

Clearly, the Examiner has failed to show that each and every element as set forth in claim 1 is taught or suggested by Davis. In particular, the Examiner has failed to show that Davis teaches or suggests at least one horizontal support table liftably cantilevered on the pair of upright support members; lift driving means for lifting the horizontal support table vertically; and

a robot placed on the horizontal support table and having horizontally rotating arms for taking up and transporting the plate, as recited in claim 1.

In view of all of the foregoing, Appellant respectfully submits that the Examiner's rejection is erroneous as a matter of law. Thus, the Board is respectfully requested to remove this rejection of claim 1.

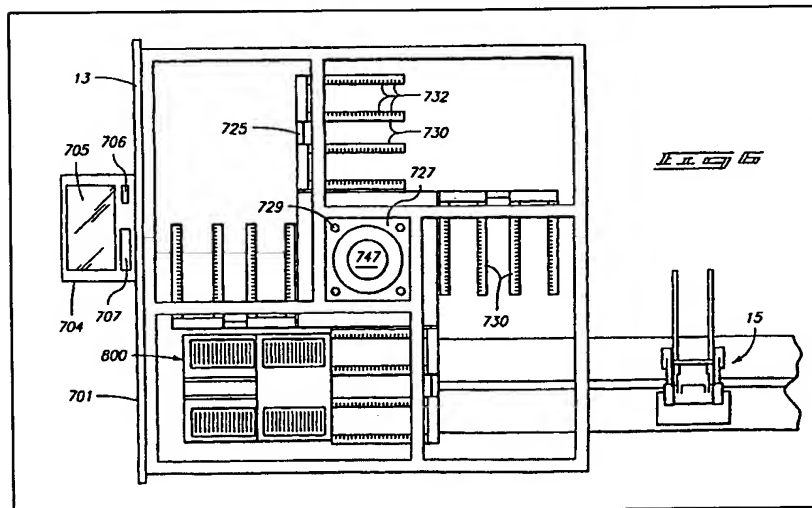
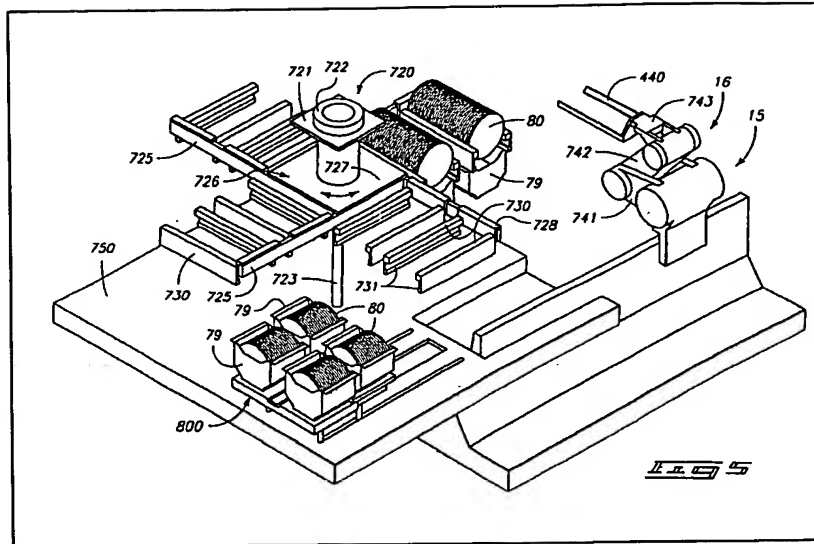
ii. The Rejection is Erroneous as a Matter of Fact

Further, the Examiner's rejection is erroneous as a matter of fact.

In particular, Appellant would again point out that nowhere does Davis teach or suggest *"at least one horizontal support table liftably cantilevered on the pair of upright support members; lift driving means for lifting the horizontal support table vertically; and a robot placed on the horizontal support table and having horizontally rotating arms for taking up and transporting the plate"*, as recited in claim 1 (Application Figures 1-6; page 20, line 5-page 22, line 8). As noted above, these features may allow the invention to eliminate the need for a large power which is required conventionally (Application at page 4, lines 6-12).

Clearly, Davis does not teach or suggest these novel features.

Indeed, the Examiner on page 3 of the Office Action alleges that Davis teaches a pair of upright support members standing at a predetermined interval, referring Appellant to "Fig. 5 and Fig. 6, element 15" (See below).



Because the Examiner's allegation is so vague, Appellant is left to guess which part of the robotic conveyor 15 the Examiner is attempting to equate with the upright support members.

So, Appellant guesses that the Examiner is attempting to equate the rail 7 with the upright support members of the claimed invention. However, Appellant would point out that the claimed invention includes a PAIR of (i.e., two) upright support members. Therefore, it is completely

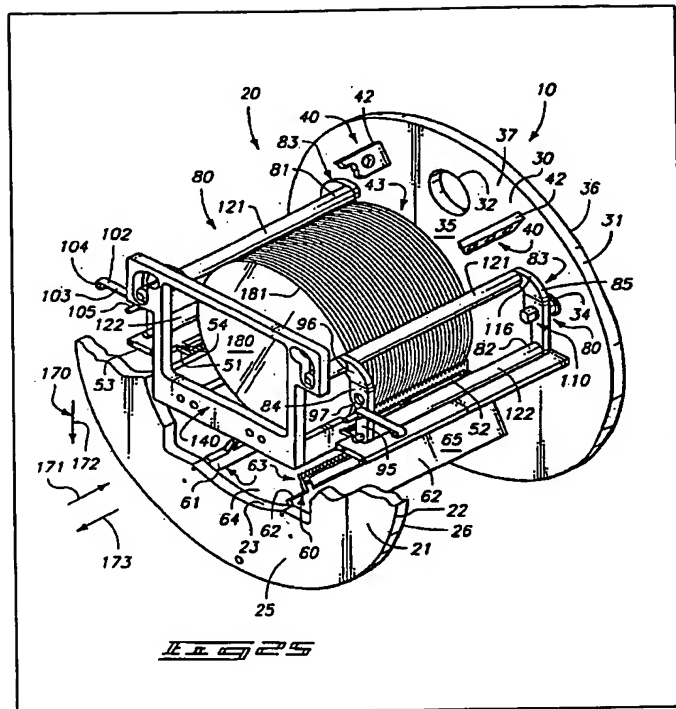
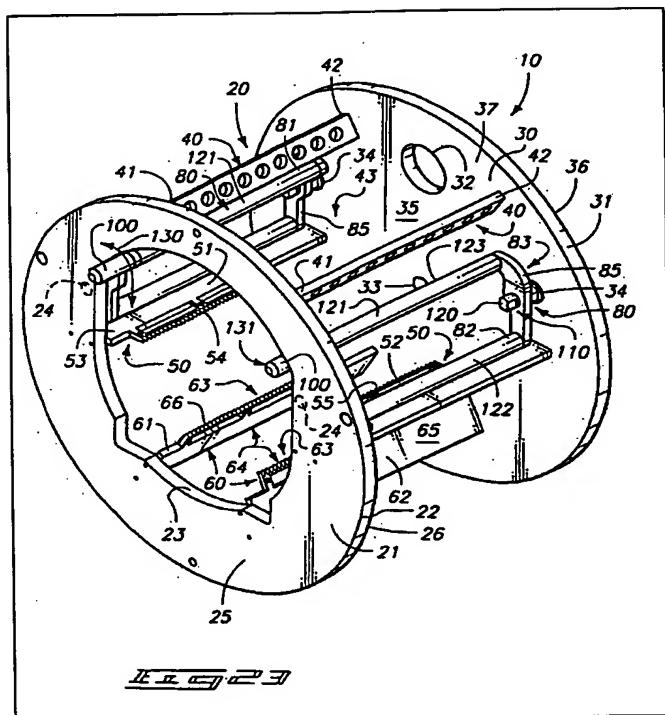
unreasonable to equate the rail 7 in Davis with the PAIR of upright support members of the claimed invention.

Next, the Examiner alleges that Davis teaches at least one horizontal support table liftably cantilevered on the pair of upright support members, referring Appellant to col. 7, lines 49-56 and col. 15, lines 30-49. These passages are set forth below:

The carrousel assembly further includes a plurality of carrousel support arms 725 which extend outwardly and are arranged to provide four cantilevered beam portions which can be advantageously used to support wafers 80 and wafer carriers 79. As shown, the carrousel support arms 725 connect in an overlapping square-shaped array to form a central square 726 which is overlaid with a carrousel central support panel 727 (Davis at col. 7, lines 49-56).

The transfer implement 140 while moving along the first course of travel 171 cooperates with the respective engagement members 100 by receiving the respective engagement members in the individual apertures 152. As seen in FIG. 25, when the transfer implement 140 is located at the end of the first course 171, and at the beginning of the second course 172, the respective engagement members are located at the first end 153 of the individual apertures 152. As best understood by a comparison of FIGS. 5 and 6, movement of the transfer implement 141 along the second course 172 has the effect of urging the individual engagement members along the sides of the respective apertures 152, from the first end 153, to the second end 154 thereof. This movement of the engagement members 100 along the individual apertures 152 draws the engagement members 100 generally radially inwardly, thereby defining the paths of travel 130 which are substantially arcuate in shape (FIG. 23). It is also noteworthy that the apertures 152 are shaped to allow installation over the engagement members 100 for the entire range of positions which the engagement members can assume (Davis at col. 15, lines 30-49).

Appellant notes that these passages refer to Figures 23 and 25 (see below) and describe a carrousel assembly 720, a plurality of carrousel support arms 725, wafers 80, wafer carriers 79, central square 726, transfer implement 140, the first course of travel 171, engagement members 100, apertures 152, the second course of travel 172, the first end 153 and second end 154 of the individual apertures 152, and paths of travel 130.



Clearly, none of these features could be confused with a "table". Thus, again, because the Examiner's allegation is so vague, Appellant is left to guess which feature described in these passages the Examiner is attempting to equate with the horizontal support table of the claimed invention.

So, Appellant guesses that the Examiner is attempting to equate the carousel support arms 725 with the horizontal support table. However, Appellant would point out that this is completely unreasonable because the Examiner is (presumably) attempting to equate the rail 7 with the pair of upright support members and the carousel support arms 725 are not liftably cantilevered on the rail 7. Instead, the carousel support arms 725 are included as part of the carousel assembly and "connect in an overlapping square-shaped array to form a central square" (Davis at col. 7, lines 52-55).

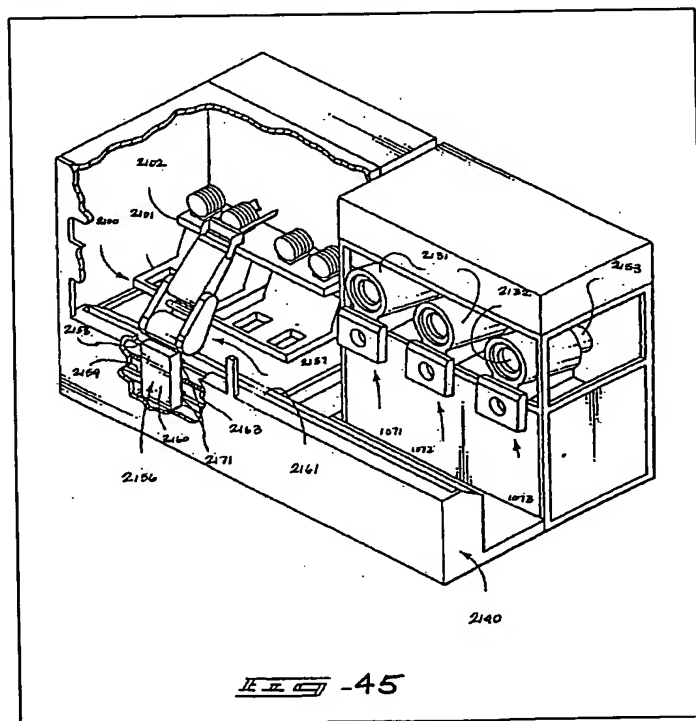
Next, the Examiner alleges that Davis teaches the "lift driving means" of the claimed invention, referring to col. 32, line 65 to col. 33, line 6 which recites:

The tram is powered along the defined path guide track by a suitable tram driver, such as a track magnetic drive in the form of linear magnetic motor 2163.

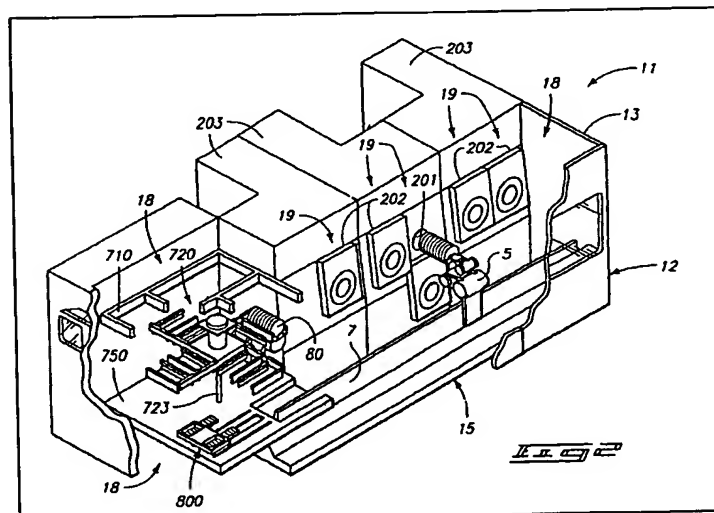
Linear magnetic motor 2163 is most preferably a linear brushless direct current motor. Such a preferred tram driver uses a series of angled magnetic segments which magnetically interact with an electromagnet on the base of the robotic conveyor to propel the tram and attached mechanical arm up and down the defined path track (Davis at col. 32, line 65-col. 33, line 6).

Presumably, the Examiner is attempting to equate the linear magnetic motor 2163 with the lift driving means of the claimed invention. This is completely unreasonable.

In fact, referring to Figure 45 (see below), Davis teaches that the motor 2163 is used to power the tram along the path guide track which is "formed by upper and lower guide bars 2158 and 2159 which are mounted along the outward side of a track support member 2161 forming part of the frame" (Davis at col. 32, lines 54-55; Figure 45).



Thus, the motor 2163 has nothing to do with the carousel support arms 725 which the Examiner attempts to equate with the horizontal support table. Moreover, the motor 2163 clearly does not move any thing "vertically". Indeed, Appellant suspects that the Examiner's keyword





"A transporting control method of a transporting apparatus, installed in a predetermined clean environment and having rotating arms and end effectors, for transporting a plate from a predetermined takeoff position to a processing chamber, comprising

based on position data of accessed position of the rotating arms and the end effectors, calculating a moving amount in a horizontal direction, a moving amount in a vertical direction and driving data of the rotating arms and the end effectors;

moving a robot based on the moving amount in the horizontal direction and the moving amount in the vertical direction and driving the rotating arms and the end effectors based on the driving data;

reading from storing means deflection data of the rotating arms and the end effectors which are extended;

calculating compensation data for compensating a deflected amount based on the deflection data; and

compensating the deflected amount based on the compensation data".

The Examiner on page 3 of the Office Action, surprisingly attempts to rely on the same vague allegations that he made with respect to claim 1 to reject claim 15. However, claim 15 (a method claim) recites several features that are not necessarily included in claim 1 (an apparatus claim).

In particular, claim 15 includes *"calculating a moving amount in a horizontal direction, a moving amount in a vertical direction and driving data of the rotating arms and the end effectors", "moving a robot based on the moving amount in the horizontal direction and the moving amount in the vertical direction and driving the rotating arms and the end effectors based on the driving data", "reading from storing means deflection data of the rotating arms and the end effectors which are extended", "calculating compensation data for compensating a deflected amount based on the deflection data", and "compensating the deflected amount based on the compensation data".*

Nowhere are these features taught or suggested by Davis, and nowhere has the Examiner

indicated where Davis allegedly teaches or suggests these features. Thus, it is unclear to Appellant what features in Davis the Examiner is relying on as allegedly teaching these features of the claimed method.

Appellant notes that on page 4 of the Office Action the Examiner alleges that Davis teaches deflection compensating means, referring to Figures 21-23 and col. 15, lines 50-67). However, Figures 21-23 have nothing to do with deflection compensation. Further, col. 15, lines 50-67 recites:

The article or object receiving assembly 63 carries or cradles the individual silicon wafers 180 in substantially the same orientation as the transfer implement 140. FIG. 27 shows that the object receiving assembly 63 passes through the gap 164 which is defined between the first and second arms 161 and 162 as the transfer implement 164 moves along the second course of travel 172. Once the plurality of wafers 180 are disposed in rested relation on the article receiving assembly 63, the transfer implement 140 moves along the third course of travel 173 out of the cavity 43. As will be seen by a study of FIG. 27, the movement of the individual retainer assemblies 80 along the paths of travel 130 between the first position 131 and second the position 132 orients the first longitudinally disposed members 121 in tangential, force engaging relation relative to the peripheral edge 181 of wafers 180. This effectively secures the individual wafers in substantially coaxial alignment relative to the axis of rotation of the rotor frame 20.

Clearly, this passage has nothing to do with compensating a deflected amount. Therefore, clearly nowhere in this passage (or anywhere else) does Davis teach or suggest calculating compensation data for compensating a deflected amount based on deflection data, and compensating the deflected amount based on the compensation data.

Therefore, Appellant would submit that Davis clearly does not teach or suggest each and every element of the claimed invention. Therefore, the Board is respectfully requested to withdraw this rejection.

Therefore, as in claim 1, even if claim 15 is given the broadest reasonable interpretation, there is at least one element in claim 15 that is not found, either expressly or inherently, in the cited references.

In view of all of the foregoing, Appellant respectfully submits that the Examiner's

rejection is erroneous as a matter of fact and law. Thus, the Board is respectfully requested to remove this rejection of claim 15.

c. Independent Claim 20: Comparison of Claim 20 with Davis

Claim 20 recites as follows:

"A transporting control method of a transporting apparatus, installed in a predetermined clean environment and having rotating arms and end effectors, for transporting a plate from a predetermined takeoff position to a processing chamber, comprising

based on position data of accessed position of the rotating arms and the end effectors, calculating a moving amount in a horizontal direction, a moving amount in a vertical direction and driving data of the rotating arms and the end effectors;

moving a robot based on the moving amount in the horizontal direction and the moving amount in the vertical direction and driving the rotating arms and the end effectors based on the driving data;

reading from storing means deflection data of the rotating arms and the end effectors which are extended, and compensation data calculated and stored in advance based on the deflected amount; and

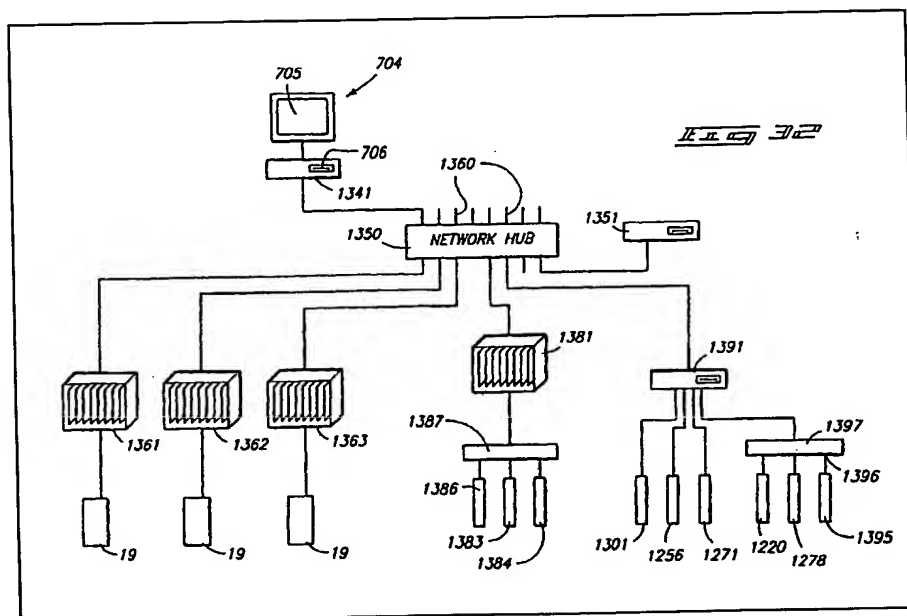
compensating the deflected amount by adjusting the moving amount in the vertical direction based on the read compensation data"

The Examiner summarily dispenses with claim 20 on page 6 of the Office Action, stating

As per claims 11 and 20-21, Davis et al. 7080652 teaches a system and an associated method an automated semiconductor processing that contains that further comprising: placing position detecting means (see Fig. 32, elements 706, 1391 and 1351) including a placing position sensor for detecting passage of the thin plate held by the end effectors and calculating means for calculating a displaced amount of the placing position from the reference point based on a detected signal of the placing position sensor (see Fig. 14); and displacement compensating means for compensating the displaced amount of the placing position based on the calculated displaced amount (see Fig. 36-54).

However, none of the drawings relied on by the Examiner (i.e., Figures 32, 14 and 36-54) teach or suggest, for example, *"calculating a moving amount in a horizontal direction, a moving amount in a vertical direction and driving data of the rotating arms and the end effectors; moving a robot based on the moving amount in the horizontal direction and the moving amount in the vertical direction and driving the rotating arms and the end effectors based on the driving data; reading from storing means deflection data of the rotating arms and the end effectors which are extended, and compensation data calculated and stored in advance based on the deflected amount; and compensating the deflected amount by adjusting the moving amount in the vertical direction based on the read compensation data"*, as recited in claim 20.

In particular, in the Examiner attempts to rely on elements 706, 1351 and 1391 in Figure 32 (see below) to support his position.



However, element 706 appears to be some form of disk drive in Figure 32 (the element is not described anywhere in Davis), element 1351 is simply described as "a computer file server"

which is connected to Network hub 1350 (Davis at col. 23, line 55), and with respect to element 1361, Davis states simply that "[h]ub 1350 is further connected to processor control modules 1361 1363, which are also conventional computers without displays. Three processor station control modules 1361 1363 are each associated with processing stations 19 respectively" (Davis at col. 23, lines 60-64).

Thus, certainly nowhere in Figure 32 (and likewise in Figures 14 and 36-54) or anywhere else, does Davis teach or suggest *"calculating a moving amount in a horizontal direction, a moving amount in a vertical direction and driving data of the rotating arms and the end effectors; moving a robot based on the moving amount in the horizontal direction and the moving amount in the vertical direction and driving the rotating arms and the end effectors based on the driving data; reading from storing means deflection data of the rotating arms and the end effectors which are extended, and compensation data calculated and stored in advance based on the deflected amount; and compensating the deflected amount by adjusting the moving amount in the vertical direction based on the read compensation data"*, as recited in claim 20.

Therefore, as in claims 1 and 15, even if claim 20 is given the broadest reasonable interpretation, there is at least one element in claim 20 that is not found, either expressly or inherently, in the cited references.

In view of all of the foregoing, Appellant respectfully submits that the Examiner's rejection is erroneous as a matter of fact and law. Thus, the Board is respectfully requested to remove this rejection of claim 20.

**3. The Prior Art Rejections of Dependent Claims 2-14, 16-19 and 21-22:
Comparison of Dependent Claims 2-14, 16-19 and 21-22 with Davis**

While independent claims 1, 15 and 20 are directed to statutory subject matter, as discussed above, dependent claims 2-14, 16-19 and 21-23 define similar statutory subject matter separately and distinctly from the independent claims, as these dependent claims recite additional elements clearly providing useful, concrete and tangible results.

a. Claim 2

Claim 2 depends from claim 1 and recites “*wherein the robot drives the horizontally rotating arms to take the plate one of from between the pair of upright support members and back to between the pair of upright support members*”.

The Examiner asserts that this feature is disclosed in Davis at Figure 6, element 15.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figure 6, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 2 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 2. Therefore, the Board is respectfully requested to withdraw this rejection.

b. Claim 3

Claim 3 depends from claim 2 and recites “*wherein the horizontal support table comprises tilt adjusting means for changing an angle of the robot placed on the horizontal support table with respect to a horizontal plane*”.

The Examiner asserts that this feature is disclosed in col. 32, lines 37-46.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in the cited passage, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 3 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 3. Therefore, the Board is respectfully requested to withdraw this rejection.

c. Claim 4

Claim 4 depends from claim 3 and recites “*deflection compensating means for compensating a deflected amount in a vertical direction of the rotating arms and a deflected amount of end effectors provided at respective ends of the rotating arms for taking up and transporting the plate*”.

The Examiner asserts that this feature is disclosed in Davis at Figures 21-23.

Although the Examiner argues that Davis discloses a deflection compensating means, Davis clearly does not disclose or suggest to compensate the deflected amount before and after being mounted.

Indeed, Appellant notes that Davis discloses the carousel assembly 720 including carousel support arm 724. In the claimed invention, the horizontal support table may be liftably cantilevered on the pair of upright support members standing at a predetermined interval. However, in Davis, the carousel assembly 720 rotates in the reference so as to be able to transact with the member 15. The reason thereof is that the member 15 cannot pivot in the horizontal plane.

Further, since the apparatus of Davis transports the circular articles to be transported in the state to be vertically upright, the compensation of the position displacement between the article to be transported and the member 15 is not necessary as well as the detection of the displaced amount, as far as the member 440 has the configuration and function to guide the article to be transported into the appropriate position because all the article to be transported are properly positioned according to gravity.

However, in contrast to Davis, in an exemplary aspect of the claimed invention, an article to be transported may relate to a large scale glass thin base plate so that the article to be transported may be broken or damaged by the weight thereof when processed in the same manner as described in Davis (i.e., vertically upright). In addition, the processing apparatus and the cassettes in Davis are also made so as to be placed horizontally.

Thus, clearly, Davis does not teach or suggest deflection compensating means as in the in the claimed invention of claim 11. Thus, it is highly possible that the article to be transported

may collide with the cassettes or the processing apparatus.

Therefore, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figures 21-23, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 4 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 4. Therefore, the Board is respectfully requested to withdraw this rejection.

d. Claim 5

Claim 5 depends from claim 4 and recites “*wherein the deflection compensating means compensates the deflected amounts of said rotating arms and said end effectors when the end effectors take up the plate*”.

The Examiner asserts that this feature is disclosed in Davis at col. 15, lines 50-67.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in the cited passage, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 5 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 5. Therefore, the Board is respectfully requested to withdraw this rejection.

e. Claim 6

Claim 6 depends from claim 5 and recites “*wherein the deflection compensating means comprises deflection storing means for storing deflected amounts in the vertical direction at a plurality of predetermined measurement points involved in movement of a reference point on one of the rotating arms and the end effectors, and wherein if the reference point moves to one of*

the measurement points, then the deflection compensating means reads a deflected amount corresponding to a present position from the deflection storing means to compensate the deflected amount”.

The Examiner asserts that this feature is disclosed in Davis at Figure 32, element 706, col. 7, lines 49-56 and Figures 23 and 32.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in the cited drawings or passages, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 6 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 6. Therefore, the Board is respectfully requested to withdraw this rejection.

f. Claim 7

Claim 7 depends from claim 6 and recites “*wherein the deflection storing means stores a deflected amount due to a self weight and a deflected amount due to holding of the plate, and the deflected amount due to the self weight and the deflected amount due to holding of the plate are used by said deflection compensating means to change a compensation amount*”.

The Examiner asserts that this feature is disclosed in Davis at Figure 32, element 706 and Figure 5, element 80.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figures 5 or 32, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 7 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 7. Therefore, the Board is respectfully requested to withdraw this rejection.

g. Claim 8

Claim 8 depends from claim 4 and recites “*wherein the deflection compensating means comprises compensation controlling means for controlling the lift driving means to raise or lower the horizontal support table based on the deflected amount thereby to compensate deflection of one of the rotating arms and the end effectors*”.

The Examiner asserts that this feature is disclosed in Davis at Figures 14 and 45.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figures 14 and 45, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 8 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 8. Therefore, the Board is respectfully requested to withdraw this rejection.

h. Claim 9

Claim 9 depends from claim 4 and recites “*wherein the deflection compensating means comprises compensation controlling means for controlling the tilt adjusting means to tilt the robot placed on the horizontal support table to one of:*

raise the end effectors to compensate deflection of one of the rotating arms and the end effectors;

lower the end effectors to compensate deflection of one of the rotating arms and the end effectors;

raise the rotating arms to compensate deflection of one of the rotating arms and the end effectors; and

lower the rotating arms to compensate deflection of one of the rotating arms and the end effectors”.

The Examiner asserts that this feature is disclosed in Davis at Figure 14, col. 32, lines 37-46.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figure 14 or the cited passage, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 9 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 9. Therefore, the Board is respectfully requested to withdraw this rejection.

i. Claim 10

Claim 10 depends from claim 4 and recites “*wherein the deflection compensating means comprises compensation controlling means for controlling the lift driving means and the tilt adjusting means for one of:*

raising the horizontal support table to compensate deflection of one of the rotating arms and the end effectors;

lowering the horizontal support table to compensate deflection of one of the rotating arms and the end effectors; and

changing the angle of the robot with respect to a horizontal plane by controlling the tilt adjusting means based on the deflected amount to compensate deflection of the rotating arms or the end effectors”.

The Examiner asserts that this feature is disclosed in Davis at Figure 14, col. 32, lines 37-46.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figure 14 or the cited passage, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 10 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 10. Therefore, the Board is respectfully requested to withdraw this rejection.

j. Claim 11

Claim 11 depends from claim 1 and recites “*placing position detecting means including a placing position sensor for detecting passage of the plate held by the end effectors; calculating means for calculating a displaced amount of the placing position from the reference point based on a detected signal of the placing position sensor; and displacement compensating means for compensating the displaced amount of the placing position based on the calculated displaced amount*”.

The Examiner asserts that this feature is disclosed in Davis at Figures 14, 32 (elements 706, 1391 and 1351) and 36-54.

Although the Examiner argues that Davis discloses a displacement compensating means, the Examiner is clearly incorrect.

Indeed, Appellant notes that Davis discloses the carrousel assembly 720 including carrousel support arm 724. In the claimed invention, the horizontal support table may be liftably cantilevered on the pair of upright support members standing at a predetermined interval. However, in Davis, the carrousel assembly 720 rotates in the reference so as to be able to transact with the member 15. The reason thereof is that the member 15 cannot pivot in the horizontal plane.

Further, since the apparatus of Davis transports the circular articles to be transported in the state to be vertically upright, the compensation of the position displacement between the article to be transported and the member 15 is not necessary as well as the detection of the displaced amount, as far as the member 440 has the configuration and function to guide the article to be transported into the appropriate position because all the article to be transported are properly positioned according to gravity.

However, in contrast to Davis, in an exemplary aspect of the claimed invention, an article to be transported may relate to a large scale glass thin base plate so that the article to be transported may be broken or damaged by the weight thereof when processed in the same manner as described in Davis (i.e., vertically upright). In addition, the processing apparatus and the

cassettes in Davis are also made so as to be placed horizontally.

Thus, clearly, Davis does not teach or suggest displacement compensating means as in the claimed invention.

Therefore, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figures 14, 32 or 36-54, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 11 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 11. Therefore, the Board is respectfully requested to withdraw this rejection.

k. Claim 12

Claim 12 depends from claim 11 and recites "*wherein the placing position detecting means calculates a displaced amount in an X axis direction, a displaced amount in a Y axis direction and a displaced amount in a rotational direction from the predetermined reference point and the displacement compensating means compensates the displaced amounts by moving the end effectors in such a direction that the calculated displaced amounts are cancelled*".

The Examiner asserts that this feature is disclosed in Davis at Figures 36-54.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figures 36-54, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 12 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 12. Therefore, the Board is respectfully requested to withdraw this rejection.

l. Claim 13

Claim 13 depends from claim 1 and recites "*moving means for moving the pair of upright*

support members horizontally ".

The Examiner asserts that this feature is disclosed in Davis at Figure 6, element 15.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figure 6, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 13 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 13. Therefore, the Board is respectfully requested to withdraw this rejection.

m. Claim 14

Claim 14 depends from claim 1 and recites "*a beam for fixedly coupling top portions of the pair of upright support members while the pair of upright support members is held in parallel "*.

The Examiner asserts that this feature is disclosed in col. 18, lines 33-55.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in the cited passage, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 14 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 14. Therefore, the Board is respectfully requested to withdraw this rejection.

n. Claim 16

Claim 16 depends from claim 15 and recites "*wherein said compensating the deflected amount comprises adjusting a tilt angle of the robot based on the compensation data thereby to compensate the deflected amount "*.

The Examiner asserts that this feature is disclosed in Davis at Figure 32, element 706, col.

7, lines 49-56 and Figures 23 and 32.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in the cited drawings or passages, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 16 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 16. Therefore, the Board is respectfully requested to withdraw this rejection.

o. Claim 17

Claim 17 depends from claim 15 and recites "*wherein said compensating the deflected amount comprises adjusting at least one of the moving amount in the vertical direction and the tilt angle of the robot based on the compensation data thereby to compensate the deflected amount*".

The Examiner asserts that this feature is disclosed in Davis at Figure 14, col. 32, lines 37-46.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figure 14 or the cited passage, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 17 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 17. Therefore, the Board is respectfully requested to withdraw this rejection.

o. Claim 18

Claim 18 depends from claim 15 and recites "*wherein the deflection data read in said reading from said storing means includes deflection data at a plurality of moving points the rotating arms and the end effectors and the calculated compensation data includes*

compensation data at each of the moving points".

The Examiner asserts that this feature is disclosed in Davis at Figure 32, element 706, col. 7, lines 49-56 and Figures 23 and 32.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in the cited drawings or passages, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 18 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 18. Therefore, the Board is respectfully requested to withdraw this rejection.

p. Claim 19

Claim 19 depends from claim 18 and recites "*wherein in said reading from said storing means, the deflection data read from the storing means depends on whether the plate is held*".

The Examiner asserts that this feature is disclosed in Davis at Figure 32, element 706.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figure 32, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 19 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 19. Therefore, the Board is respectfully requested to withdraw this rejection.

q. Claim 21

Claim 21 depends from claim 15 and recites "*detecting a placing position of the plate held by the end effectors;*

comparing the placing position and a predetermined reference placing position to calculate a displaced amount; and

performing operational control to compensate the displaced amount".

The Examiner asserts that this feature is disclosed in Davis at Figures 14, 32 (elements 706, 1391 and 1351) and 36-54.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figures 14, 32 or 36-54, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 21 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 21. Therefore, the Board is respectfully requested to withdraw this rejection.

r. Claim 22

Claim 22 depends from claim 21 and recites "*wherein the displaced amount in said comparing the placing position and said predetermined reference placing position includes a displaced amount in an X axis direction, a displaced amount in a Y axis direction and a displaced amount in a rotational axis direction from the reference placing position, and wherein the operational control in said performing operational control is performed to compensate each of the displaced amounts in said comparing the placing position and said predetermined reference placing position*".

The Examiner asserts that this feature is disclosed in Davis at Figures 36-54.

However, Appellant respectfully submits that the Examiner's position is flawed as a matter of fact and as a matter of law. Specifically, nowhere in Figures 36-54, or anywhere else for that matter, does the reference teach or suggest this feature.

Therefore, Appellant respectfully submits that even if claim 23 is given the broadest reasonable interpretation consistent with the specification, Davis clearly does not teach or suggest each and every element of the claimed invention as recited in claim 23. Therefore, the Board is respectfully requested to withdraw this rejection.

Therefore, Appellant respectfully submits that each of dependent claims 2-14, 16-19 and 21-22, like independent claims 1, 15 and 20, include at least one element which is not taught or suggested by the cited references, or any combination of the cited references.

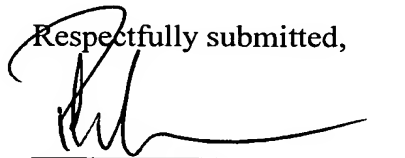
VIII . CONCLUSION

In view of the foregoing, Appellant submits that claims 1-23, all the claims presently pending in the application, are patentably distinct from the prior art of record and in condition for allowance. Thus, the Board is respectfully requested to remove the rejections of claims 1-23.

Please charge any deficiencies and/or credit any overpayments necessary to enter this paper to Attorney's Deposit Account number 50-0481.

Dated: 12/27/09

Respectfully submitted,



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CLAIMS APPENDIX

1. A transporting apparatus, installed in a given clean environment, for transporting a plate from a predetermined takeoff position to a processing chamber, comprising:
 - a pair of upright support members standing at a predetermined interval;
 - at least one horizontal support table liftably cantilevered on the pair of upright support members;
 - lift driving means for lifting the horizontal support table vertically; and
 - a robot placed on the horizontal support table and having horizontally rotating arms for taking up and transporting the plate.
2. The transporting apparatus as claimed in claim 1, wherein the robot drives the horizontally rotating arms to take the plate one of from between the pair of upright support members and back to between the pair of upright support members.
3. The transporting apparatus as claimed in claim 2, wherein the horizontal support table comprises tilt adjusting means for changing an angle of the robot placed on the horizontal support table with respect to a horizontal plane.
4. The transporting apparatus as claimed in claim 3, further comprising:
 - deflection compensating means for compensating a deflected amount in a vertical direction of the rotating arms and a deflected amount of end effectors provided at respective ends of the rotating arms for taking up and transporting the plate.
5. The transporting apparatus as claimed in claim 4, wherein the deflection compensating means compensates the deflected amounts of said rotating arms and said end effectors when the end effectors take up the plate.

6. The transporting apparatus as claimed in claim 5, wherein the deflection compensating means comprises deflection storing means for storing deflected amounts in the vertical direction at a plurality of predetermined measurement points involved in movement of a reference point on one of the rotating arms and the end effectors, and

wherein if the reference point moves to one of the measurement points, then the deflection compensating means reads a deflected amount corresponding to a present position from the deflection storing means to compensate the deflected amount.

7. The transporting apparatus as claimed in claim 6, wherein the deflection storing means stores a deflected amount due to a self weight and a deflected amount due to holding of the plate, and the deflected amount due to the self weight and the deflected amount due to holding of the plate are used by said deflection compensating means to change a compensation amount.

8. The transporting apparatus as claimed in claim 4, wherein the deflection compensating means comprises compensation controlling means for controlling the lift driving means to raise or lower the horizontal support table based on the deflected amount thereby to compensate deflection of one of the rotating arms and the end effectors.

9. The transporting apparatus as claimed in claim 4, wherein the deflection compensating means comprises compensation controlling means for controlling the tilt adjusting means to tilt the robot placed on the horizontal support table to one of:

raise the end effectors to compensate deflection of one of the rotating arms and the end effectors;

lower the end effectors to compensate deflection of one of the rotating arms and the end effectors;

raise the rotating arms to compensate deflection of one of the rotating arms and the end effectors; and

lower the rotating arms to compensate deflection of one of the rotating arms and the end

effectors.

10. The transporting apparatus as claimed in claim 4, wherein the deflection compensating means comprises compensation controlling means for controlling the lift driving means and the tilt adjusting means for one of:

raising the horizontal support table to compensate deflection of one of the rotating arms and the end effectors;

lowering the horizontal support table to compensate deflection of one of the rotating arms and the end effectors; and

changing the angle of the robot with respect to a horizontal plane by controlling the tilt adjusting means based on the deflected amount to compensate deflection of the rotating arms or the end effectors.

11. The transporting apparatus as claimed in claim 1, further comprising:

placing position detecting means including a placing position sensor for detecting passage of the plate held by the end effectors;

calculating means for calculating a displaced amount of the placing position from the reference point based on a detected signal of the placing position sensor; and

displacement compensating means for compensating the displaced amount of the placing position based on the calculated displaced amount.

12. The transporting apparatus as claimed in claim 11, wherein the placing position detecting means calculates a displaced amount in an X axis direction, a displaced amount in a Y axis direction and a displaced amount in a rotational direction from the predetermined reference point and the displacement compensating means compensates the displaced amounts by moving the end effectors in such a direction that the calculated displaced amounts are cancelled.

13. The transporting apparatus as claimed in claim 1, further comprising:

moving means for moving the pair of upright support members horizontally.

14. The transporting apparatus as claimed in claim 1, further comprising:
a beam for fixedly coupling top portions of the pair of upright support members while the pair of upright support members is held in parallel.
15. A transporting control method of a transporting apparatus, installed in a predetermined clean environment and having rotating arms and end effectors, for transporting a plate from a predetermined takeoff position to a processing chamber, comprising
based on position data of accessed position of the rotating arms and the end effectors, calculating a moving amount in a horizontal direction, a moving amount in a vertical direction and driving data of the rotating arms and the end effectors;
moving a robot based on the moving amount in the horizontal direction and the moving amount in the vertical direction and driving the rotating arms and the end effectors based on the driving data;
reading from storing means deflection data of the rotating arms and the end effectors which are extended;
calculating compensation data for compensating a deflected amount based on the deflection data; and
compensating the deflected amount based on the compensation data.
16. The transporting control method as claimed in claim 15, wherein said compensating the deflected amount comprises adjusting a tilt angle of the robot based on the compensation data thereby to compensate the deflected amount.
17. The transporting control method as claimed in claim 15, wherein said compensating the deflected amount comprises adjusting at least one of the moving amount in the vertical direction and the tilt angle of the robot based on the compensation data thereby to compensate the

deflected amount.

18. The transporting control method as claimed in claim 15, wherein the deflection data read in said reading from said storing means includes deflection data at a plurality of moving points the rotating arms and the end effectors and the calculated compensation data includes compensation data at each of the moving points.

19. The transporting control method as claimed in claim 18, wherein in said reading from said storing means, the deflection data read from the storing means depends on whether the plate is held.

20. A transporting control method of a transporting apparatus, installed in a predetermined clean environment and having rotating arms and end effectors, for transporting a plate from a predetermined takeoff position to a processing chamber, comprising

based on position data of accessed position of the rotating arms and the end effectors, calculating a moving amount in a horizontal direction, a moving amount in a vertical direction and driving data of the rotating arms and the end effectors;

moving a robot based on the moving amount in the horizontal direction and the moving amount in the vertical direction and driving the rotating arms and the end effectors based on the driving data;

reading from storing means deflection data of the rotating arms and the end effectors which are extended, and compensation data calculated and stored in advance based on the deflected amount; and

compensating the deflected amount by adjusting the moving amount in the vertical direction based on the read compensation data.

21. The transporting control method as claimed in claim 15, further comprising detecting a placing position of the plate held by the end effectors;

comparing the placing position and a predetermined reference placing position to calculate a displaced amount; and

performing operational control to compensate the displaced amount.

22. The transporting control method as claimed in claim 21, wherein the displaced amount in said comparing the placing position and said predetermined reference placing position includes a displaced amount in an X axis direction, a displaced amount in a Y axis direction and a displaced amount in a rotational axis direction from the reference placing position, and

wherein the operational control in said performing operational control is performed to compensate each of the displaced amounts in said comparing the placing position and said predetermined reference placing position .

23. The transporting apparatus as claimed in claim 1, wherein the robot comprises a body which is horizontally rotatably fixed on said horizontal support table, said horizontally rotating arms including an end which is rotatably fixed to said body of said robot.

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EVIDENCE APPENDIX

Not Applicable

RELATED PROCEEDINGS APPENDIX

Not Applicable